Trend Study 30-42-98

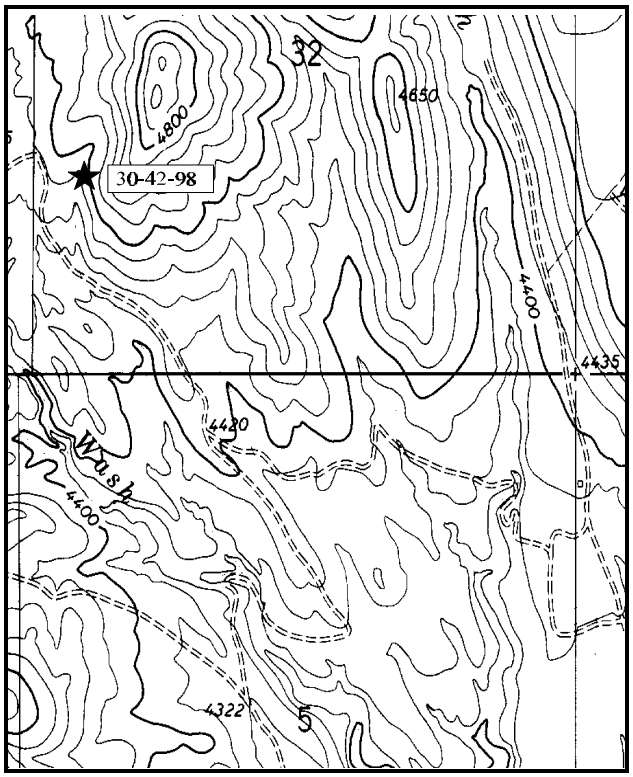
Study site name: Grapevine Spring . Range type: Sagebrush-Reseeded .

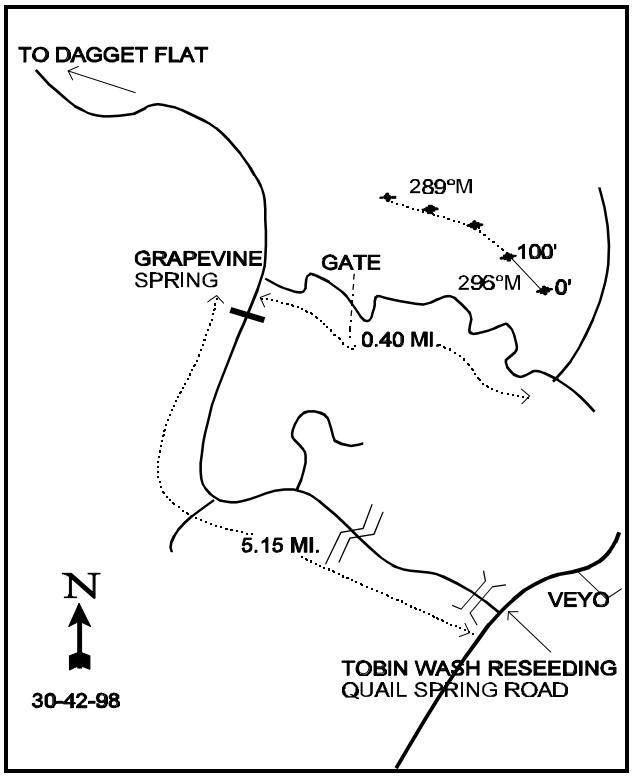
Compass azimuth: frequency baseline 296 M degrees. (Lines 3 & 4 289°M)

Footmark (first frame placement) 5 feet. Frequency belt placement; line 1 (10 & 92ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

From the town of Veyo, proceed west on Gunlock Road 5.6 miles until you come to a sign saying Tobin Wash and with Eagle Mountain Ranch just off the road. Take the Goldstrike Road for 5.15 miles until you come to Grapevine Spring. Just past Grapevine Spring, take the fork to the right. Travel 0.40 miles till you come to another fork in the road to the left and stop. From the fork in the road, the 0-foot baseline stake is 10 paces away at a bearing of 281 degrees true. The study is marked by green steel "T" fence posts approximately 12 to 18 inches in height. The baseline is marked with browse tag #7098.





Map Name: Gunlock, Utah Diagrammatic Sketch

Township 39S , Range 17W , Section 32 UTM 4137237.097 N, 252747.291 E

DISCUSSION

Trend Study No. 30-42 (50B-5c)

The Grapevine Spring trend study is within the critical deer winter range, one-half mile east of Grapevine Spring. The study is an old pinyon-Juniper chained area that currently supports a mixed browse stand. Elevation is 4,000 feet (the lowest of any site in the management unit) on a gentle 5% slope and a south to southeast aspect. Pellet group data from 1998 show a moderate level of deer use at 32 days use/acre. There was also a few cattle pats encountered (2 cow days use/acre).

Soils are shallow, moderately rocky, and generally lack effective cover. Effective rooting depth (see methods) was estimated at 14 inches in 1998. Soil texture is a sandy clay loam with a neutral pH (6.7). Phosphorus may be limiting to plant growth at 8.5 ppm, when 10 ppm is considered the minimum value for normal plant development. There is a considerable amount of pavement concentrated on the ground surface in the shrub interspaces. Litter consists largely of dead cheatgrass. Erosion is moderate, yet it is less severe than on untreated pinyon-juniper woodlands in the immediate area. The gentle, almost flat terrain helps prevent serious soil loss.

The key browse species is mountain big sagebrush with lesser amounts of desert ceanothus and Stansbury cliffrose. The population of big sagebrush has increased from 566 plants/acre in 1982 to 2,432 in 1992 and 4,380 by 1998. Seedling and young plants are numerous and vigor is good. Desert ceanothus increased 53% in density between 1982 and 1992, but estimates from 1998 are similar to 1982 levels. Stansbury cliffrose occurs in similar densities. Both species have good age structures and vigor. Utilization is currently ('98) light to moderate with heavier use reported in 1982 and 1992 for desert ceanothus. Other preferred browse species found on the site include a few scattered green ephedra.

The most abundant browse species in 1992 was the increaser broom snakeweed which had expanded from 8,799 plants/acre in 1982 to 11,933 by 1992. Seedlings and young were numerous, indicating an expanding population at that time. During the 1998 reading, population density actually declined 74% to 3,080 plants/acre. The majority of the change in density was due to the much larger sample used in 1998, but it is apparent from the number of dead plants counted that the population had really declined. Actually the number of dead plants in the population only accounts for about 6% of the decrease. Therefore, the change in density is mostly associated with the larger sampling design giving more accurate estimates for shrubs with discontinuous and/or clumped distributions. Currently, there are still high numbers of seedlings and young. Surviving pinyon and juniper trees are increasing in size on the site. Point quarter data from 1998 estimate 47 pinyon and 54 juniper trees/acre. Average basal diameter is 2.6 inches for pinyon and 3.1 inches for juniper. Overhead canopy cover is estimated at only 3%.

Grass composition consists of both native and seeded species which are not very vigorous and produce little available forage. The principal species, intermediate wheatgrass and bottlebrush squirreltail, had all sustained approximately 30% utilization during the 1982 reading. The annual grasses, cheatgrass brome and foxtail brome, provide 76% of the grass cover. Perennial forbs are sparse with relatively few species found more than occasionally. The most abundant species in 1998 was Searls prairie clover which provided 65% of the forb cover. Forb utilization is generally light.

1982 APPARENT TREND ASSESSMENT

Soil condition is poor, but not noticeably declining. There is a lot of bare ground and pavement, yet erosion has been limited somewhat by the gentle slope. Vegetation trend is stable to improving, if one uses the key species as the principal criteria. Mountain big sagebrush is expanding, but so also is broom snakeweed. Other browse species are relatively static. Perennial herbaceous cover is poor, but could be improved with time and grazing management.

1992 TREND ASSESSMENT

Basal vegetative cover increased from 1% to 3% since the last reading, while bare ground increased by 14%. Litter cover has declined from 60% to 49%. Protective ground cover has declined slightly from 82% to 79%. Trend for soil is stable to slightly declining. The browse trend is up due to significant increases in the density and reproductive potentials of key shrub species. However, broom snakeweed is abundant and has also increased. Trend for the herbaceous understory is down with large decreases in quadrat frequencies of both grasses and forbs.

TREND ASSESSMENT
soil - stable to slightly declining
browse - up
herbaceous understory - down

1998 TREND ASSESSMENT

Trend for soil is down slightly due to an increase in bare ground from 21% to 29% and a slight decline in litter cover. Erosion is still not a serious problem due to the gentle terrain. Trend for browse is up slightly. Mountain big sagebrush appears to be increasing with light to moderate use, good vigor and low decadence. It currently contributes 60% of the browse cover. Desert ceanothus and cliffrose have lower densities compared to 1992, but most of the difference is due to the larger sample used in 1998. Desert ceanothus displays less heavy use. Both desert ceanothus and cliffrose appear to have stable populations. Trend for the herbaceous understory is up slightly. Sum of nested frequency of perennial grasses increased slightly while nested frequency of perennial forbs increased 11 fold. Several new forb species were encountered in the larger sample.

TREND ASSESSMENT
soil - down slightly
browse - up slightly
herbaceous understory - up slightly, but poor

HERBACEOUS TRENDS --
Herd unit 30 , Study no: 42

Type	Species	Nested Frequency '92	Nested Frequency '98	Quadrat Frequency '82	Quadrat Frequency '92	Quadrat Frequency '98	Average Cover % '98
G	Agropyron cristatum	1	5	16	1	2	.15
G	Agropyron intermedium	40	*3	38	16	2	.01
G	Agropyron trachycaulum	-	7	1	-	2	.06
G	Bromus rubens (a)	-	11	-	-	5	.37
G	Bromus tectorum (a)	-	121	-	-	46	1.02
G	Oryzopsis hymenoides	3	-	2	1	-	-
G	Sitanion hystrix	67	*50	20	34	27	.96
G	Vulpia octoflora (a)	-	12	-	-	5	.02
Total for Annual Grasses		0	144	0	0	56	1.42
Total for Perennial Grasses		111	65	77	52	33	1.19
Total for Grasses		111	209	77	52	89	2.62

Type	Species	Nested Frequency '92	Nested Frequency '98	Quadrat Frequency '82	Quadrat Frequency '92	Quadrat Frequency '98	Average Cover % '98
F	Arabis holboellii	-	-	3	-	-	-
F	Castilleja linariaefolia	-	2	-	-	1	.00
F	Calochortus nuttallii	-	*15	-	-	7	.04
F	Comandra pallida	4	-	1	2	-	-
F	Cirsium spp.	-	1	-	-	1	.00
F	Cordylanthus parviflorus	11	-	3	4	-	-
F	Dalea searlsiae	-	*33	-	-	16	3.84
F	Draba spp. (a)	-	66	-	-	28	.48
F	Eriogonum spp.	3	-	-	1	-	-
F	Euphorbia spp.	-	*28	-	-	12	.28
F	Frasera albomarginata	-	*13	5	-	5	.25
F	Lomatium spp.	-	1	-	-	1	.00
F	Lotus plebeius	32	*34	21	15	18	.57
F	Medicago sativa	-	-	2	-	-	-
F	Microsteris gracilis (a)	-	3	-	-	1	.00
F	Penstemon spp.	-	6	12	-	2	.06
F	Phlox hoodii	6	9	-	5	4	.33
F	Sphaeralcea grossulariaefolia	1	-	-	1	-	-
F	Unknown forb-perennial	9	3	-	6	1	.00
F	Viguiera multiflora	-	5	-	-	3	.04
Total for Annual Forbs		11	69	0	4	29	0.49
Total for Perennial Forbs		55	150	47	30	71	5.45
Total for Forbs		66	219	47	34	100	5.94

* Indicates significant difference at % = 0.10 (annuals excluded)

BROWSE TRENDS --
Herd unit 30 , Study no: 42

Type	Species	Strip Frequency '98	Average Cover % '98
B	Artemisia tridentata vaseyana	82	20.35
B	Ceanothus greggii	9	-
B	Chrysothamnus viscidiflorus viscidiflorus	0	-
B	Cowania mexicana stansburiana	12	3.59
B	Ephedra viridis	0	.15
B	Eriodictyon angustifolium	6	-
B	Garrya flavescens	2	1.00
B	Gutierrezia sarothrae	45	2.53
B	Juniperus osteosperma	3	1.75
B	Opuntia spp.	0	-
B	Pinus monophylla	1	.53
B	Quercus turbinella	9	3.96
Total for Browse		169	33.90

CANOPY COVER --
Herd unit 30 , Study no: 42

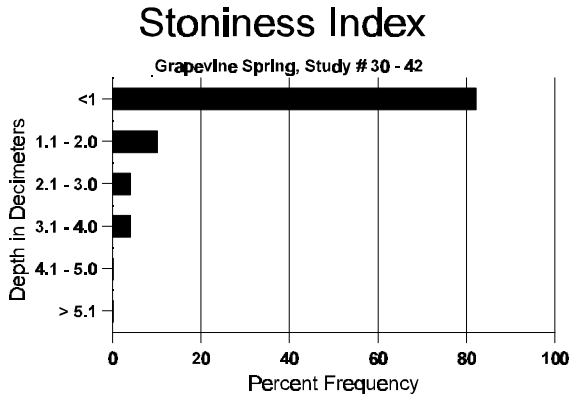
Species	Percent Cover '98
Juniperus osteosperma	2
Pinus monophylla	1

BASIC COVER --
Herd unit 30 , Study no: 42

Cover Type	Nested Frequency '98	Average Cover % '82	'92	'98
Vegetation	241	1.00	3.00	39.41
Rock	239	1.50	3.00	7.40
Pavement	308	19.75	26.00	22.61
Litter	381	60.00	49.00	45.50
Cryptogams	14	0	0	.05
Bare Ground	283	17.75	21.00	28.76

SOIL ANALYSIS DATA --
Herd Unit 30, Study # 42, Study Name: Grapevine Spring

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
14.3	55.2 (14.2)	6.7	48.0	25.4	26.6	1.8	8.5	108.8	.6



PELLET GROUP FREQUENCY --
Herd unit 30 , Study no: 42

Type	Quadrat Frequency '98
Rabbit	17
Deer	22
Cattle	1

BROWSE CHARACTERISTICS --
Herd unit 30 , Study no: 42

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia tridentata vaseyana																		
S	82	5	-	-	-	-	-	-	-	-	5	-	-	-	166			5
	92	6	-	-	-	-	-	-	-	-	6	-	-	-	200			6
	98	84	-	-	3	-	-	-	-	-	87	-	-	-	1740			87
Y	82	8	-	-	-	-	-	-	-	-	8	-	-	-	266			8
	92	15	7	-	-	-	-	1	-	-	23	-	-	-	766			23
	98	30	-	-	7	-	-	1	-	-	38	-	-	-	760			38
M	82	9	-	-	-	-	-	-	-	-	9	-	-	-	300	15	20	9
	92	31	13	1	2	-	-	1	-	-	48	-	-	-	1600	26	32	48
	98	114	59	-	2	-	-	1	-	-	176	-	-	-	3520	22	33	176
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	92	2	-	-	-	-	-	-	-	-	2	-	-	-	66			2
	98	5	-	-	-	-	-	-	-	-	1	-	1	3	100			5
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	92	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	180			9

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	+77%
'92	27%	01%	00%	+44%
'98	27%	00%	02%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	566	Dec:	0%
	'92	2432		3%
	'98	4380		2%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Ceanothus greggii																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	92	9	-	-	-	-	-	-	-	-	9	-	-	-	300			9
	98	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	92	5	-	-	-	-	-	-	-	-	5	-	-	-	166			5
	98	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
M	82	6	-	1	-	-	-	-	-	-	7	-	-	-	233	31	29	7
	92	3	2	-	-	-	3	1	-	-	9	-	-	-	300	26	40	9
	98	7	2	-	-	-	-	-	-	-	9	-	-	-	180	27	42	9
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	92	-	-	1	-	-	-	-	-	-	1	-	-	-	33			1
	98	2	-	-	-	-	-	-	-	-	1	-	-	1	40			2
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	92	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	14%	00%	+53%
'92	13%	27%	00%	-52%
'98	17%	00%	08%	

Total Plants/Acre (excluding Dead & Seedlings)				
'82	233	Dec:		0%
'92	499			7%
'98	240			17%

Chrysothamnus viscidiflorus viscidiflorus																		
M	82	16	-	-	-	-	-	-	-	-	16	-	-	-	533	11	16	16
	92	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	92	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	
'92	00%	00%	00%	
'98	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'82	533	Dec:		-
'92	0			-
'98	0			-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Cowania mexicana stansburiana																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	92	2	-	-	-	-	-	-	-	-	2	-	-	-	66			2
	98	2	-	-	1	-	-	-	-	-	3	-	-	-	60			3
Y	82	1	-	-	-	-	-	-	-	-	1	-	-	-	33			1
	92	6	4	-	-	-	-	-	-	-	10	-	-	-	333			10
	98	3	1	-	-	-	-	-	-	-	4	-	-	-	80			4
M	82	2	-	-	-	-	-	-	-	-	2	-	-	-	66	31	44	2
	92	3	2	-	-	-	-	-	-	-	3	2	-	-	166	61	66	5
	98	5	3	-	-	1	-	-	-	-	9	-	-	-	180	58	71	9
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	92	-	-	1	-	-	-	-	-	-	1	-	-	-	33			1
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	+81%
'92	38%	06%	00%	-51%
'98	38%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'82	99	Dec:		0%
'92	532			6%
'98	260			0%

Ephedra viridis																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	92	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	0	29	42	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	
'92	00%	00%	00%	
'98	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)			
'82	0	Dec:	-
'92	0		-
'98	0		-

Eriodictyon angustifolium																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	92	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	98	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	92	2	-	-	-	-	-	-	-	-	2	-	-	-	66	20	22	2
	98	26	-	-	-	-	-	-	-	-	26	-	-	-	520	24	16	26
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	92	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	98	5	-	-	-	-	-	-	-	-	4	-	-	1	100			5

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	
'92	00%	00%	00%	+90%
'98	00%	00%	03%	

Total Plants/Acre (excluding Dead & Seedlings)				
'82	0	Dec:		0%
'92	66			0%
'98	640			16%

Garrya flavescens

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
M	82	1	-	-	-	-	-	-	-	-	1	-	-	-	33	24	30	1
	92	1	-	-	-	-	-	-	-	-	1	-	-	-	33	20	24	1
	98	1	-	-	-	-	1	-	-	-	1	1	-	-	40	22	31	2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	+ 0%
'92	00%	00%	00%	+18%
'98	00%	50%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	33	Dec:	-
	'92	33		-
	'98	40		-

Gutierrezia sarothrae

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	92	54	-	-	16	-	-	-	-	-	70	-	-	-	2333			70
	98	44	-	-	-	-	-	-	-	-	44	-	-	-	880			44
Y	82	16	-	-	-	-	-	-	-	-	16	-	-	-	533			16
	92	24	-	-	3	-	-	-	-	-	27	-	-	-	900			27
	98	27	-	-	2	-	-	-	-	-	29	-	-	-	580			29
M	82	248	-	-	-	-	-	-	-	-	248	-	-	-	8266	12	12	248
	92	293	1	-	5	-	-	1	-	-	300	-	-	-	10000	10	12	300
	98	106	-	2	2	-	-	-	-	-	110	-	-	-	2200	8	10	110
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	92	28	-	-	2	-	-	1	-	-	29	-	2	-	1033			31
	98	15	-	-	-	-	-	-	-	-	4	-	-	11	300			15
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	92	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	500			25

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	+26%
'92	.27%	00%	.55%	-74%
'98	00%	01%	07%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	8799	Dec:	0%
	'92	11933		9%
	'98	3080		10%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Juniperus osteosperma																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	92	1	-	-	-	-	-	-	-	-	1	-	-	-	33			1
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	82	1	-	-	-	-	-	-	-	-	1	-	-	-	33			1
	92	2	-	-	-	-	-	-	-	-	2	-	-	-	66			2
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	82	3	-	-	-	-	-	-	-	-	3	-	-	-	100	53	43	3
	92	2	2	-	-	-	-	-	-	-	2	2	-	-	133	73	58	4
	98	3	-	-	-	-	-	-	-	-	3	-	-	-	60	-	-	3

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	+33%
'92	33%	00%	00%	-70%
'98	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	133	Dec:	-
	'92	199		-
	'98	60		-

Opuntia spp.																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	92	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	0	6	13	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	
'92	00%	00%	00%	
'98	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	0	Dec:	-
	'92	0		-
	'98	0		-

Pinus monophylla																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	92	1	-	-	-	-	-	-	-	-	1	-	-	-	33			1
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	92	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	98	1	-	-	-	-	-	-	-	-	1	-	-	-	20	-	-	1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	
'92	00%	00%	00%	-39%
'98	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	0	Dec:	-
	'92	33		-
	'98	20		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Quercus turbinella																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	92	8	-	-	-	-	-	-	-	-	8	-	-	-	266			8
	98	2	-	-	1	-	-	-	-	-	3	-	-	-	60			3
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	92	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	98	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
M	82	1	-	-	-	-	-	-	-	-	1	-	-	-	33	44	59	1
	92	-	2	-	-	-	-	-	-	-	2	-	-	-	66	51	49	2
	98	22	-	-	-	-	-	-	-	-	22	-	-	-	440	55	68	22
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	92	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	+50%
'92	100%	00%	00%	+86%
'98	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	33	Dec:	-
	'92	66		-
	'98	460		-